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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/992,084	11/19/2001	Peng Jiang	1789-09300	9640
23505	7590	12/01/2004	EXAMINER	
CONLEY ROSE, P.C. P. O. BOX 3267 HOUSTON, TX 77253-3267			METZMAIER, DANIEL S	
			ART UNIT	PAPER NUMBER
			1712	
DATE MAILED: 12/01/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/992,084

Applicant(s)

JIANG ET AL.

Examiner

Daniel S. Metzmaier

Art Unit

1712

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 10 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 10-21, 30-42 and 44 is/are pending in the application.
- 4a) Of the above claim(s) 12-15, 18 and 19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10, 11, 16, 17, 20-21, 30-42 and 44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 09/10/2004.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

Claims 10-21, 30-42 and 44 are pending.

#### ***Election/Restrictions***

1. Claims 12-15, 18 and 19 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in Paper filed April 29, 2003.

#### ***Drawings***

2. The drawings were received on September 10, 2004. These drawings are acceptable.

#### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 44 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 44 is dependent on canceled claim 1. It is unclear what is the intended scope of claim 1.

#### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application

by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 10-11, 16-17, 20-21, 30-42 and 44 are rejected under 35 U.S.C. 102(e)<sup>1</sup> as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Zakhidov et al., US 6,261,469. Zakhidov et al (column 6, lines 33 et seq, examples and claims; particularly claims 14 and 25) discloses methods of making an inverse opal structure and structures therefrom employing said inverse opal as a template. Zakhidov et al discloses said process at column 6, lines 33 et seq. Step I (lines 34-36) comprises assembling the monodispersed spherical silica in an opal-like lattice (A). Step II (lines 42-45) comprises joining the monodispersed silica in an opal-like lattice. Step III (lines 48-53) comprises infiltrating said opal-like lattice with (B). Step IV (lines 58-61) comprises removing the opal-like lattice (A). Zakhidov et al (column 7, lines 14 et seq) discloses the further processing of the inverse opal as a volumetric template for the deposition of material C followed by removal of material B.

Zakhidov et al (column 11, lines 44 et seq) discloses the particular choice of materials B and C depend on the application need and include as specific examples the use of metals and optical materials. Zakhidov et al (column 15, lines 45 et seq; and column 16, lines 60-63) discloses the formation of metallic photonic bandgap materials employing patentees' process. The ellipsoidal colloids read on and would have been expected for the ordered materials with a lattice formed from sintering. Said structure would be expected to follow through the templating to the final materials formed.

Zakhidov et al (column 13, lines 1 et seq) discloses metal deposition from metal salts and specifically mentions gold.

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<sup>1</sup> Zakhidov et al, US 6,261,469, has an effective filing date of October 13, 1998.

To the extent Zakhidov et al differs from applicants' claims in a lack of the particular species set forth specifically in an example of the Zakhidov et al reference, it would have been obvious to one of ordinary skill in the art at the time of applicants' invention to employ the materials taught and suggested in the Zakhidov et al reference for the application need as taught therein at column 11, lines 43 et seq..

***Allowable Subject Matter***

9. Claims directed to the methods defining the particles formed as ellipsoidal having an aspect ratio of 1.47 to 5.0 would be deemed allowable.
10. The following is a statement of reasons for the indication of allowable subject matter: the prior art does not disclose methods of making ellipsoidal colloids having the disclosed aspect ratio disclosed and as set forth above.

***Response to Arguments***

11. Applicant's arguments filed September 10, 2004 have been fully considered but they are not persuasive.
12. Applicants (page 7) assert the claims (see Office Action) are rejected over Zakhidov et al, US 6,517,763. The reference relied is Zakhidov et al, US 6,261,469.

Applicants assert the Zakhidov et al materials do not include porous materials that are non-spherical. Applicants cite col. 7, l. 61 to, p.8, l. 9 and quotes a portion thereof. The quotation appears to correspond to '763. The entirety thereof is recited hereafter ('469 at column 7, line 54, to column 8, line 2):

Such sintering process should preferably be accomplished at below the temperature at which the spheres become sufficiently fluid that a nearly spherical shape can not be maintained.

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To illustrate this approach, consider the embodiment of this invention where the A-material spheres are  $\text{SiO}_2$  spheres in which the required interface is created by sintering. Such sintering is normally achieved by a two step annealing process. The first step is a low temperature anneal at typically 100-120.degree. C. for 2-3 days to eliminate excess water, and the second step is typically a high temperature anneal at 650-800.degree. C. for several hours (resulting in Si--O--Si linkages between the silica of two adjacent spheres). The flow of silica between spheres at high temperatures creates the necks of finite diameter (up to 125 nm for 250 nm spheres) without substantially changing the spherical shape of each ball. (emphasis added).

While applicants assert the Zakhidov et al reference is distinct from the claims because it lacks a non-spherical porous material, it is clear from the Zakhidov et al characterization that the materials are changed and characterized in the prior art as nearly spherical. Since the claims do not distinguish between said terms as non-spherical, nearly spherical and without substantial change. Said materials are clearly taught to include necks, further modifying their initial spherical geometry. It is reasonable to conclude the Zakhidov et al materials define non-spherical materials.

Furthermore, Zakhidov et al (column 9, line 66, to column 10, line 1) discloses "For the purposes of this invention the term sphere includes near spherical particles that pack similarly to spheres (such as oblong or isosohedral).".

13. Applicants assert the term "necks" does not define non-spherical pores and refers to the instant figure 12 and claims 21 and 42. To the extent said difference defines a patentable difference, the independent claims are broader than the asserted difference.

14. Regarding applicants' claims 21, 41 and 42; an ellipsoid is defined as a solid figure that every planar cross-section is either an ellipse or a circle. Oblate is defined as approximately spherical, flattened at an axis. None of the terms is defined quantitatively. It is noted that applicants set forth the invention having an aspect ratio defined by figure 12 having a lower limit of 1.47 and an upper limit of 5. See page 31, line 20, to page 33, line 3; particularly page 32, lines 6-8, and page 33, lines 1-2.

15. Furthermore, proper claim drafting requires that a dependent claim be more narrowly defined than the claim that it depends (see 37 CFR 1.75(c)). Claim 20 limits "said second-generation colloid comprises non-spherical particles". Clearly based on proper claim drafting the independent claim 1 contemplates more than "non-spherical" colloidal particles.

### ***Conclusion***

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure as directed to non-elected species and cited for applicants convenience. Particular attention is directed to MacCallam, US 3,267,041 (see at least figures 3-6), and Kato, US 4,784,794 (see at least the abstract), which disclose ellipsoidal ferric oxide and zirconia colloidal particles.

17. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not




mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel S. Metzmaier whose telephone number is (571) 272-1089. The examiner can normally be reached on 9:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Daniel S. Metzmaier  
Primary Examiner  
Art Unit 1712

DSM